calcium-dependent binding of drugs to the cyclic phosphodiesterase activator protein. Several papers are devoted to protein kinases which are the intracellular receptors for cyclic nucleotides and form the essential link between activation of the nucleotide cyclases and the expression of functional activity. The paper on the characterisation and location of nucleotide-linked receptors in the central nervous system examines some methodological problems which confront the scientist studying neurotransmitter-sensitive adenylate cyclases in brain homogenates. Any symposium on the biological role of cyclic nucleotides must consider their functional importance in secretory cells. Although a primary role for calcium and cyclic AMP in stimulus–secretion coupling is experimentally supported, there does not appear to be a unifying hypothesis for the control of fluid, electrolyte and macromolecule (enzymes) secretion from secretory cells by secretory hormones and transmitters. The view that activation of guanylate cyclase in secretory cells is entirely secondary to calcium may require revision, and evidence for a primary messenger role for cyclic GMP is increasing.

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Membranes and their Cellular Functions (Second Edition)

by J. B. Finean, R. Coleman and R. H. Michell
Blackwell Scientific; Oxford, 1978
ix + 157 pages. £4.80

A reviewer of this imaginative, amusing and excellently written book cannot avoid a touch of envy of those readers for which it will provide first sight of the field of membranology. Like the previous edition it is extensively illustrated and again enlivened by the splendid cartoons of T. A. Bramley.

The second edition of *Membranes and their Cellular Functions* costs 71% more than the 1974 edition, but the text is 25% longer and its 8 chapters, the last an Epilogue, are 2 more than in the first edition. Altogether this is not an impossible *net* rate of inflation over 5 years for book prices and the present edition is within reach of most undergraduate budgets. The contents have been largely reorganized – sections on: Composition and structure; Recognition response and communication; Biosynthesis and turnover; Generation and utilization of ion gradients – all having been given autonomous chapters in the second edition. Incidentally, much of the latter section on ion gradients is a completely new addition and I found it an enjoyably fresh and uncomplicated treatment of this somewhat difficult area.

Each of the authors has long experience with membranes, and their treatment is well-judged and wholly avoids the wilder flights of fancy, without eschewing however quite powerful generalizations in some cases, e.g., on p. 55 'In resting man, active transport accounts for about 30–40% of the total energy utilization'. I specially enjoyed the sections on: Passage of small molecules; Generation and utilization of ion gradients; Recognition, response and communication. In several of these, quite a deal of molecular detail is given, e.g. on p. 62 for Na^+/K^+-dependent ATPase action. The least informative section is: Biosynthesis and turnover. This is largely due to the poverty of primary reviews on membrane biosynthesis. The only such review to appear recently with any claim at all to comprehensive coverage and lack of bias, that by Parry in *Subcellular Biochemistry*, volume 5 (edited by D. B. Roodyn, 1978) and the much shorter article by Lodish and Rothman (*Scientific American*, Jan. 1979) must post-date the present book's going to press by at least a year. Finally, the clarity of reproduction of the diagrams and the quality of the paper and print should be a source of satisfaction to future makers of slides, to the authors and the publishers alike. It is gratifying, too, not to recognize a single significant printer's error.

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